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ABSTRACT

This document lists core standards and occupational knowledge and skills that have been identified and validated by industry as necessary to all Georgia students in secondary-level technical/engineering programs. First, foundation skills are grouped as follows: basic skills (reading, writing, arithmetic/mathematics, listening, speaking); thinking skills (creative thinking, decision making, problem solving, knowing how to learn, reasoning); and personal qualities (responsibility, self-esteem, sociability, self-management, integrity, honesty). The second section, which lists competencies specific to the technical/engineering cluster, is organized by the following categories/subcategories: resources (time, money, materials and facilities, human resources); interpersonal (participating as a team member, teaching others new skills, serving clients and customers, exercising leadership, negotiating, working with diversity); information (acquiring, evaluating, organizing, maintaining, interpreting, and communicating information and using computers to process information); systems (understanding systems); and technology (selecting technology, applying technology to tasks). Each section includes the following: skill statement(s); performance standard(s); list of occupational knowledge and skills; and code number under which the knowledge/skill is listed in Georgia's career cluster standards. (MN)

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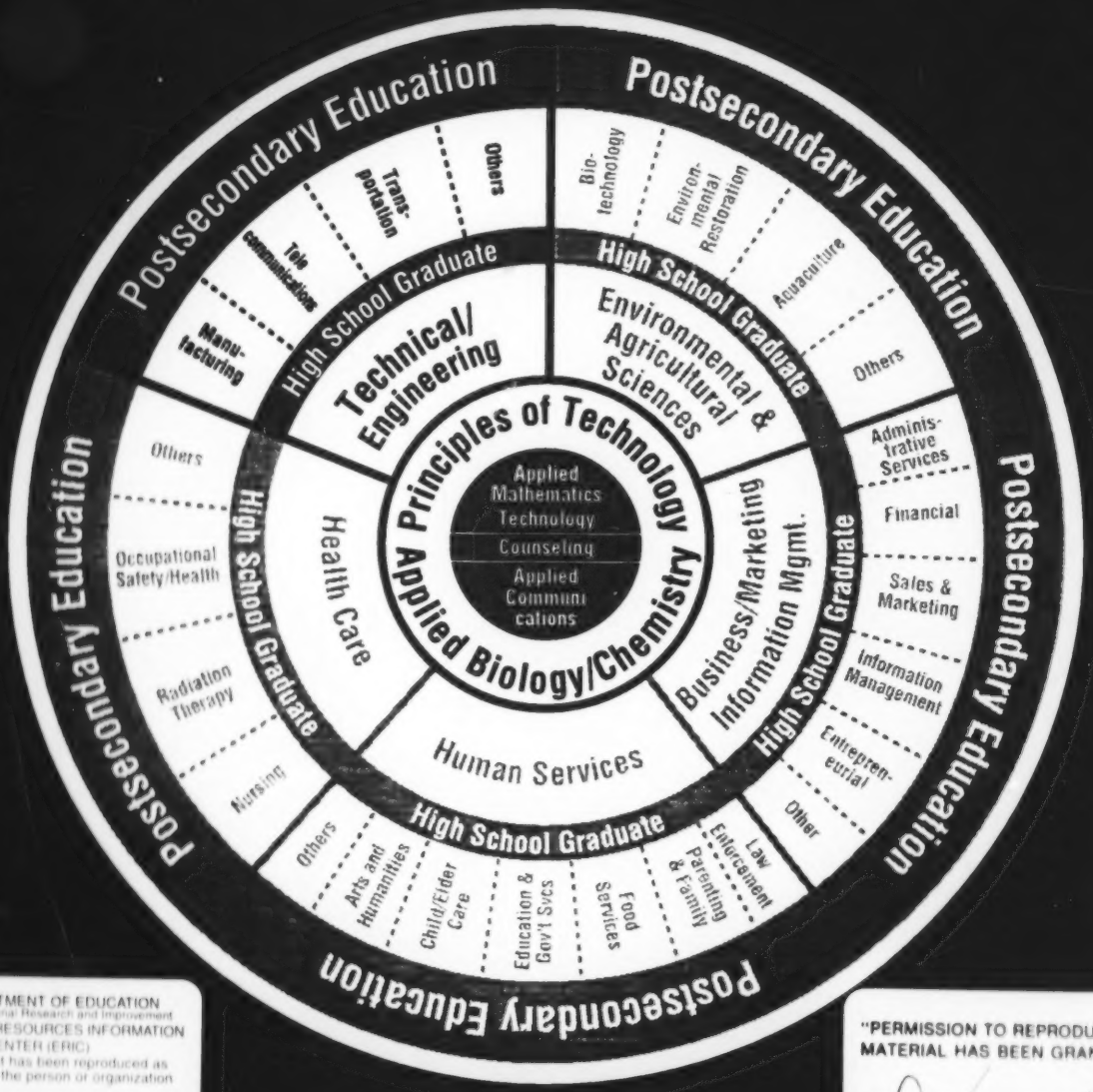
Georgia Core Standards For Occupational Clusters

ED 391 896

Technical/Engineering



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Introduction

Concerns about student preparedness for the high performance workforce have spurred the development of national-level skill standards by industry representatives to improve the global competitiveness of U.S. industry. Georgia has taken the initiative at the state level to work with business and industry in identifying core occupational knowledge and skills that offer a framework for career focus in our schools. This career-cluster framework, based on an elevated standard, will afford all students in Georgia's schools the foundation they will need to enter the workforce or to continue occupational specialization and education at the postsecondary level. The concept will also allow students to personalize their learning directions and hasten their preparation in becoming productive citizens.

The Occupational Research Group (in the School of Leadership and Lifelong Learning in the College of Education) at the University of Georgia facilitated for the Georgia Department of Education the development of statewide, industry-validated curriculum standards for academic and occupational skills needed by all students in Georgia. This developmental effort helps meet the goal of establishing a career focusing process in Georgia's schools. These curriculum standards address core knowledge and skill areas common to all program areas, including both school-based and work-based competencies, and are organized around the Georgia Department of Education's five cluster areas or programs of study:

Technical/Engineering
Health Care
Business/Marketing and Information Management
Human Services
Environmental and Agricultural Sciences

The standards for each cluster include the core academic competencies and the non-occupation specific knowledge and skills common to a broad cluster area of occupations. Georgia's skill standards were developed in a systematic manner employing the skills and input of a wide array of stakeholders in the education of Georgians. Phase one of this process involved a thorough investigation of information on existing state and national standards/skills/competencies, professional/trade associations, workforce trends, and acquisition of documents related to skill competencies for each cluster area. The information was compiled into a report on each cluster area for presentation to business/industry Standards Development Teams. This report included a master listing of tasks and competencies identified by other groups, and information on core/basic academic competencies underlying skill performance, organized by the SCANS competency areas.

Phase two of the developmental process featured the establishment of five statewide Standards Development Teams made up of business and industry representatives from across the state, one team for each of the career-cluster areas. Experienced faculty and staff from the Occupational Research Group and the Department of Occupational Studies at the University of Georgia conducted and facilitated meetings. A structured group process was used to review and validate or revise the tasks and competencies from the phase one document. The product of this validation process was then formulated into a survey by project staff and sent to additional business/ industry representatives for each career-cluster for feedback. Next, a grouping of experienced teachers and curriculum specialists from across the state met to review the industry-validated curriculum standards. They identified the supporting academic knowledge and skills for each career-cluster area using the state's Quality Core Curriculum and the graduation exit exam.

The product of our efforts to date is the listing of industry-validated statewide curriculum standards, with core competencies for both work- and school-based knowledge and skills. Because of the continuing changes in occupational skills requirements, an assessment component of the project will be added for reviewing and modifying the career-clusters as necessary.

The standards are an important component of Georgia's School-to-Work Transition initiative and a preliminary step in the adoption of the career-cluster concept. The career-cluster approach to curriculum design is based on the idea that a variety of different occupations/jobs require similar basic skills. It is also based on the belief that certain basic skills and knowledge are essential for all students, regardless of the profession to which they aspire. Students begin by learning these basic common skills; move on to acquire the basic skills necessary for a given group of jobs; then learn the specific applications for a specific job. The career-cluster approach provides school systems with the opportunity to involve larger numbers of students in occupational classes to build a stronger and broader base for further specialization. This broad base makes it possible for individuals to change specialties in the future as job opportunities and/or requirements change and facilitates life-long educational experiences which can enhance individual productivity and happiness.

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Technical/Engineering Career-Cluster Foundation

Technical/engineering field personnel must have the three-part career-cluster foundation comprised of basic skills, thinking skills, and personal qualities. This career-cluster foundation is an integral part of the industry-validated competencies in each identified career-cluster. Related core academic knowledge and skills are the academic foundations which help facilitate effective learning when integrated with the occupational knowledge and skills. For course and program planning convenience the related core academic knowledge and skills section, which includes communications, math, social science, and science are coded and included in a companion document. This document functions as a source for the code listings cited in the career-cluster standards. The code can be referenced with the occupational knowledge and skills to develop curricula that integrate these elements into cohesive career-cluster programs of study. This section presents industry-identified common core standards and occupational knowledge and skills for secondary level preparation in Technical/Engineering occupations. Computer literacy is a key to almost all the standards.

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Reading

Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.

Standard: Demonstrates the ability to locate, understand, and interpret written information, especially as it relates to technical/engineering fields (i.e., manuals, graphs, schedules, publications) by determining the main idea or essential message; identify relevant details, facts, and specifications; infer or locate the meaning of unknown or technical vocabulary; and judge the accuracy, appropriateness, and plausibility of reports or other writing.

Occupational Knowledge and Skills

- Reads and follows label information
- Reads and prepares charts, graphs and diagrams
- Reads and understands appropriate technical manuals and journals
- Demonstrates ability to discern main idea of sentence and paragraph
- Utilizes and comprehends inter-departmental/company communications
- Utilizes and comprehends employee publications

Academic Knowledge and Skills

- SCI 3-4
- MAT 1-40
- SOC 44, 47
- COM 19, 35-38, 40-42, 44-45

Writing

Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flowcharts.

Standard: Demonstrates the ability to communicate thoughts, ideas, information, and messages in writing by creating documents (i.e., letters, memos, directions, manuals, reports, graphs, flowcharts); develop supporting documentation to the appropriate level of detail; revise for correct information and appropriate emphasis; and edit for form, grammar, spelling, and punctuation.

Occupational Knowledge and Skills

- Is able to write legibly
- Communicates and documents information through writing
- Uses proper industry terminology
- Prepares simple reports
- Prepares documents including memos, letters, reports, directions, manuals, and flowcharts
- Performs review procedures for proper spelling and punctuation by using a dictionary, thesaurus, or spell checker in a software program

Academic Knowledge and Skills

- MAT 1-40
- SOC 47, 50
- COM 21-33

Arithmetic/Mathematics

Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.

Standard: Demonstrates the ability to perform basic computations by using numerical concepts and calculations (addition, subtraction, multiplication, division, fractions, percentages).

Occupational Knowledge and Skills

- Uses basic numerical concepts such as whole numbers and percentages
- Makes estimates with and without a calculator
- Performs simple physics and chemistry calculations
- Solves simple algebraic, geometric, and trigonometric calculations
- Understands simple statistical processes and calculations
- Performs problem solving using mathematical concepts
- Translates numerical data into narrative information and narrative information into numerical data
- Calculates and converts English/metric measurements
- Reads and prepares charts, graphs, and geometric figures

Academic Knowledge and Skills

- MAT 1-40

Listening

Receives, attends to, interprets, and responds to verbal messages and other cues.

Standard: Demonstrates the ability to receive, attend to, interpret, and respond to verbal messages and other cues, that are appropriate for an office, lab, or field situation.

Occupational Knowledge and Skills

- Paraphrases and provides feedback to listener
- Demonstrates effective listening skills
- Listens to, understands, and follows verbal directions
- Interprets body language and other non-verbal cues

Academic Knowledge and Skills

- MAT 1-40
- COM 3-5, 7, 9, 11, 13-14

Speaking

Organizes ideas and communicates orally.

Standard: Demonstrates the ability to orally (or with sign language) present ideas, thoughts, and messages to listeners in a clear and concise manner.

Occupational Knowledge and Skills

- Addresses people properly
- Conveys an appropriate voicemail message
- Explains the nature of effective verbal communications
- Handles incoming and outgoing telephone calls in a businesslike manner
- Makes oral presentations
- Participates in a teleconference/video conference
- Participates in conversations, discussions, and group presentations
- Uses proper grammar and vocabulary
- Speaks in a clear and concise manner
- Relays thoughts and ideas in a logical manner
- Demonstrates ability to lead (follow and participate in) group discussions
- Demonstrates ability to ask appropriate questions when information is not understood
- Interprets and uses verbal and body language, appropriate in style, tone, and level of complexity to the audience and the occasion

Academic Knowledge and Skills

- SCI 1, 4
- MAT 1-40
- SOC 5-6, 8
- COM 1-8, 11-12, 14-15

Creative Thinking

Generates new ideas.

Standard: Demonstrates the ability to create new ideas by using imagination freely, combine ideas or information in new ways, make connections between seemingly unrelated ideas, and reshape goals in ways that reveal new possibilities.

Occupational Knowledge and Skills

- Applies appropriate creativity skills
- Participates productively in brainstorming sessions
- Employs reasoning skills
- Identifies, clarifies, and solves a problem

Academic Knowledge and Skills

- SCI 1, 4
- MAT 1-40
- SOC 47, 53, 55, 66, 68
- COM 53-63

Decision Making

Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

Standard: Demonstrates the ability to specify goals, generate alternatives, consider risks, and evaluate and choose best alternatives.

Occupational Knowledge and Skills

- Identifies alternative responses to decision making situations
- Establishes criteria for evaluating alternative responses to decision problems
- Explains techniques for group decision making
- Identifies the decision making process (recognizes problem exists, searches for underlying cause, defines problem, refines problem, classifies problem, and defines additional goals)
- Implements financial and non-financial analysis techniques to make decisions
- Projects outcomes of alternatives to decision problems
- Makes decisions based on best information available
- Exhibits flexibility when working with others
- Establishes priorities
- Coordinates activities and tasks that occur simultaneously
- Performs techniques necessary to decision making as a team leader
- Makes career decisions

Academic Knowledge and Skills

- MAT 1-40
- SOC 34, 37, 43, 51, 55
- COM 1-9, 11, 13-15, 53-63

Problem Solving

Recognizes problems and devises and implements a plan of action.

Standard: Demonstrates the ability to recognize that a problem exists or may exist, the reasons for a problem, a plan to solve the problem, an evaluation of the plan to solve the problem, and revise a plan when warranted.

Occupational Knowledge and Skills

- Demonstrates a proactive attitude toward problem solving
- Adjusts to change
- Demonstrates and maintains good problem solving skills
- Explains the nature of plans
- Explains approaches to effective planning
- Utilizes the decision making process
- Describes the nature of problems faced by technical/engineering field workers
- Recognizes that a problem exists
- Identifies possible reasons for discrepancies in regard to problems
- Specifies goals and restraints to resolve or solve a problem
- Demonstrates effective communication skills in problem solving
- Generates alternatives
- Considers risks
- Evaluates and chooses the best alternative
- Devises and implements a plan of action to resolve a problem
- Evaluates and monitors the action-plan as it progresses
- Revises the plan as necessary

Academic Knowledge and Skills

- MAT 1-40
- SOC 8-10
- COM 53-63

Knowing How to Learn

Uses efficient learning techniques to acquire and apply new knowledge and skills.

Standard: Demonstrates the ability to use efficient learning techniques in both familiar and changing situations.

Occupational Knowledge and Skills

- Describes and utilizes research statistics
- Describes how learning skills are required in the fields of technical/engineering science
- Explains the need for ongoing education as a worker
- Identifies the types of training and human resources development provided to workers (i.e., training seminars, continuing education)
- Is aware of personal learning styles
- Understands formal and informal learning strategies
- Makes observations and anticipates needs
- Pays close attention to details
- Demonstrates competency for literature review

Academic Knowledge and Skills

- MAT 1-40
- COM 23, 62-63

Reasoning

Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

Standard: Demonstrates the ability to use reasoning when faced with problems or ill-defined situations requiring clarification.

Occupational Knowledge and Skills

- Uses inductive and deductive reasoning to draw conclusions from available information
- Extracts rules or principles from a set of objects or written text
- Applies rules and principles to a new situation
- Determines which conclusions are correct when given a set of facts and a set of conclusions

Academic Knowledge and Skills

- SCI 1
- MAT 1-40
- SOC 55, 66
- COM 53-63

Responsibility

Exerts a high level of effort and perseveres toward goal attainment.

Standard: Demonstrates the ability to accomplish tasks in a timely manner.

Occupational Knowledge and Skills

- Demonstrates initiative
- Demonstrates self-control
- Plans and organizes work
- Sets reasonable and attainable standards
- Works to best of ability and with minimal supervision
- Displays a high level of concentration even when assigned an unpleasant task
- Applies quality principles in all aspects of work
- Applies decision making techniques in the workplace
- Demonstrates responsibility for fellow workers' well being
- Continues to take training to upgrade skills
- Demonstrates an ability to work independently
- Is willing to put out extra effort, as required by work environment
- Demonstrates the ability to complete tasks on time with accuracy
- Follows directions and procedures
- Displays a positive attitude

Academic Knowledge and Skills

- MAT 1-40
- SOC 36, 42-43

Self-Esteem

Believes in own self-worth and maintains a positive view of self.

Standard: Demonstrates the ability to exhibit the knowledge of one's own skills and abilities, an awareness of one's impact on others, and knowledge of one's own emotional capacity and needs and how to address those needs.

Occupational Knowledge and Skills

- Assesses personal interests and skills
- Demonstrates awareness of impact on others
- Explains the concept of self-esteem
- Explains the concept of self-understanding
- Maintains appropriate personal appearance
- Maintains positive attitude
- Uses feedback for personal growth
- Demonstrates enthusiasm and confidence about work and learning new tasks
- Follows appropriate corporate dress and hygiene standards
- Demonstrates good personal ethical characteristics and behaviors

Academic Knowledge and Skills

- SOC 36, 42-43
- COM 46-48

Sociability

Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.

Standard: Demonstrates the ability to assert self in familiar and unfamiliar social situations, relate well to others, respond appropriately to situations, and take interest in what others say and do.

Occupational Knowledge and Skills

- Addresses needs of individual personalities
- Demonstrates empathy for others
- Demonstrates interest and enthusiasm
- Demonstrates orderly and systematic behavior
- Dresses appropriately for a job in the technical/engineering fields
- Responds appropriately to a variety of social situations
- Takes interest in what others say and do
- Uses appropriate assertiveness in social and business situations
- Participates with others in work situations by being interactive, asking questions, offering suggestions, and being involved in discussion and activities
- Values the opinions of others
- Tolerates other people's cultural differences
- Defines discrimination, harassment, and equity
- Demonstrates non-discriminatory behavior
- Demonstrates an ability to work under stress
- Maintains good interpersonal skills

Academic Knowledge and Skills

- MAT 1-40
- SOC 36, 42-43
- COM 1-15, 46-48

Self-Management

Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.

Standard: Demonstrates the ability to asses one's own knowledge, skills, and abilities accurately.

Occupational Knowledge and Skills

- Sets well-defined and realistic personal goals
- Monitors progress toward goal attainment
- Motivates self through goal achievement
- Is a "self-starter"
- Maintains professional competency
- Develops physical fitness program to achieve level of conditioning required at job
- Accepts constructive criticism
- Demonstrates ability to learn new process steps
- Participates in product or process specific training and reports significant information
- Understands the concept of empowerment

Academic Knowledge and Skills

- MAT 1-40
- SOC 37

Integrity/Honesty

Chooses ethical courses of action.

Standard: Demonstrates the ability to be trusted and exhibits trustworthiness.

Occupational Knowledge and Skills

- Understands the impact of violating beliefs and codes of an organization, self, or others
- Chooses an ethical course of action in all work assignments and personal involvement with others
- Protects business equipment and materials
- Is truthful in all communications with co-workers and supervisors
- Identifies good ethical business behavior
- Analyzes the relationship of personal values and goals to work ethic both in and out of the workplace
- Demonstrates honesty and integrity
- Assumes responsibility for decisions and actions
- Exercises the rights and responsibilities of citizenship in the workplace

Academic Knowledge and Skills

- MAT 1-40
- SOC 37, 43
- COM 46-48, 60

Technical and Engineering Competencies

The skill standards listings which follow were identified by Georgia business and industry representatives as the generic skills necessary for the broad cluster of occupations in this field. They are organized according to the Secretary's Commission on Achieving Necessary Skills (SCANS) report. The essential general workplace skills and safety skills were also identified by the Standards Development Team for this project.

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Time

Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.

Standard: Demonstrates the ability to select goal-relevant activities, rank activities, allocate time, and prepare and follow schedule.

Occupational Knowledge and Skills

- Discusses techniques for planning and organizing work
- Describes time management principles
- Develops a personal week/month/year schedule of activities

Academic Knowledge and Skills

- MAT 1-40
- SOC 32, 47, 58

Money

Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.

Standard: Demonstrates the ability to use and prepare budgets, and make adjustments to meet objectives for a technical/engineering field related activity.

Occupational Knowledge and Skills

- Defines capital gain
- Explains cash flow and income statements
- Describes purpose of a five year cash flow plan
- Discusses marketing and sales opportunities
- Discusses the gain/loss of capital securities
- Discusses factors contributing to cost effectiveness

Academic Knowledge and Skills

- MAT 1-40
- SOC 25

Materials and Facilities

Acquires, stores, allocates, and uses materials or space efficiently.

Standard: Demonstrates the ability to manage materials and facilities.

Occupational Knowledge and Skills

- Discusses requirements for acquiring, labeling, and storing supplies
- Allocates and uses materials and space efficiently
- Outlines the process for moving materials in and out of storage
- Outlines the procedures for maintaining a sanitary and orderly facility
- Discusses inventory control requirements
- Describes methods for minimizing loss of materials using examples of proper storage, protection from theft, and adverse climatic conditions
- Discusses the selection of storage containers that are compatible with the materials to be stored

Academic Knowledge and Skills

- MAT 1-40

Human Resources

Assesses skills and distributes work accordingly, evaluates performance, and provides feedback.

Standard: Demonstrates the ability to understand the human element in the technical/engineering workplace.

Occupational Knowledge and Skills

- Evaluates performance
- Understands a business/career plan
- Matches team member skills to activity
- Evaluates outcomes of a task
- Encourages others to act in accordance with good safety, health, and environmental standards

Academic Knowledge and Skills

- MAT 1-40
- COM 1-15, 21-33

Participating as a Member of a Team

Contributes to group effort.

Standard: Demonstrates the ability to participate effectively as a member of a technical/engineering team and contribute to the group effort.

Occupational Knowledge and Skills

- Demonstrates effective team membership (teamwork) skills
- Identifies various team processes
- Identifies components of team dynamics
- Identifies and demonstrates interpersonal skills/characteristics required for working with and for others
- Compares and contrasts the role of a team with the role of an individual
- Recognizes the difference between a team environment workplace and a conventional workplace
- Identifies style of leadership used in team work
- Identifies the characteristics of a diverse workforce
- Discusses participation as a team member and/or member of a cross-functional committee
- Completes a task requiring team work

Academic Knowledge and Skills

- MAT 1-40
- COM 1-9, 11, 13-15

Teaching Others New Skills

Acts as trainer, mentor, and instructor; coordinates instruction.

Standard: Demonstrates the ability to teach others new workplace skills.

Occupational Knowledge and Skills

- Describes the principles of Lifelong Learning
- Conducts and/or participates in meetings
- Gives directions for completing jobs/tasks
- Orients new employees
- Participates in a coaching/mentoring situation
- Discusses the use of praise and corrective feedback to evaluate job performance

Academic Knowledge and Skills

- MAT 1-40
- COM 1-15, 21-33

Serving Clients/Customers

Works to satisfy customers' expectations.

Standard: Demonstrates the ability to satisfy a customer/client in a technical/ engineering situation.

Occupational Knowledge and Skills

- Discusses the factors which define the customer
- Describes factors affecting customer service
- Describes the customer focus of total quality management
- Explains customer service techniques
- Explains the concept of customer service
- Communicates with customer to establish requirements of expected service

Academic Knowledge and Skills

- MAT 1-40

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Exercising Leadership

Communicates ideas to justify position, persuades and convinces others, and responsibly challenges existing procedures and policies.

Standard: Demonstrates the ability to provide leadership in a technical/engineering business organization.

Occupational Knowledge and Skills

- Describes leadership traits
- Describes the influences of corporate culture on employee motivation
- Lists the characteristics of a good team leader
- Demonstrates good team leadership qualities
- Applies facilitation skills in a team setting
- Recognizes leadership styles appropriate for the workplace

Academic Knowledge and Skills

- MAT 1-40
- SOC 8, 16-17, 36, 57

Negotiating

Works toward agreements involving exchange of resources, and resolves divergent interests.

Standard: Demonstrates the ability to resolve conflicts.

Occupational Knowledge and Skills

- Discusses the techniques of gentle persuasion
- Handles situations when the customer/client is at fault
- Interprets customer service policies and resolves customer/client complaints to their satisfaction
- Identifies and reacts appropriately to sexual intimidation/harassment
- Discusses the Win-Win technique of resolving conflicts

Academic Knowledge and Skills

- MAT 1-40
- SOC 41-43
- COM 4, 8

Working with Diversity

Works well with men and women from diverse backgrounds.

Standard: Demonstrates the ability to perform in a work environment with individuals of different gender, cultures, lifestyles, attitudes, and abilities.

Occupational Knowledge and Skills

- Channels and controls emotional reactions
- Demonstrates respect for the feelings and beliefs of others
- Demonstrates an appreciation for the similarities and differences among individuals
- Defines stereotype, bias, and discriminatory behavior in the work environment
- Fosters positive working relationships in a technical/engineering situation
- Recognizes personal biases and stereotypes
- Values individual diversity

Academic Knowledge and Skills

- MAT 1-40
- SOC 7-8, 38, 46, 57
- COM 46-48

Acquiring and Evaluating Information

Reads, processes information, and follows directions.

Standard: Demonstrates the ability to identify, assimilate, and integrate information about technical/engineering fields from diverse sources.

Occupational Knowledge and Skills

- Interprets quantitative and qualitative records
- Describes methods of data collection (e.g., mail, telephone, interview, focus group)
- Describes sources of primary data
- Describes techniques for assessing ongoing behavior
- Describes the nature and scope of information management
- Describes the nature of scientific research
- Explains the nature of validity and reliability
- Explains the relationship between research purpose and research objectives
- Explains the role of ethics in research
- Explains types of research approaches (e.g., observation, survey instrument)

Academic Knowledge and Skills

- SCI 1, 3
- MAT 1-40
- SOC 50-51
- COM 1-15, 21-33, 36, 39, 42, 50-51, 53, 56-63

Standard: Acquires and interprets scope and history of technical/engineering occupations.

Occupational Knowledge and Skills

- Recognizes current accreditation and certification regulations
- Recognizes career options and employment opportunities
- Identifies professional organizations and trade journals
- Recognizes the impact of public opinion on the development of technical/ engineering fields

Academic Knowledge and Skills

- MAT 1-40

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Organizing and Maintaining Information

Interprets and clarifies directions, data, and information prepared by self and others.

Standard: Demonstrates the ability to prepare, maintain, and interpret quantitative and qualitative data.

Occupational Knowledge and Skills

- Analyzes the use of databases in organizing scientific and research data
- Determines features of information sources
- Explains the nature of information processing

Academic Knowledge and Skills

- SCI 1, 3, 28-35, 143-144, 150-151, 153-154
- MAT 1-40

Interpreting and Communicating Information

Reads, processes information and instruction, and implements appropriate steps to communicate.

Standard: Demonstrates the ability to convert information from one form to another and convey orally, graphically, and in writing as needed.

Occupational Knowledge and Skills

- Describes techniques for interpreting and communicating technical/engineering research data
- Describes the organization of a technical/engineering research report
- Explains basic statistical analysis of data
- Discusses techniques for the presentation of research findings

Academic Knowledge and Skills

- SCI 4, 142, 151-152, 155
- MAT 1-40
- SOC 47
- COM 1-15, 21-33, 35-38, 41-42, 45

Using Computers to Process Information

Demonstrates the basic knowledge of computing.*

Standard: Identifies the hardware used in computing.

Occupational Knowledge and Skills

- Identifies common computer hardware such as a keyboard, monitor, diskette drive, mouse, CD-ROM, tape drive, printer, and the casement housing the computer's electronics
- Turns ON a computer system (i.e., the "computer," monitor, and printer)
- Reboots the computer system
- Distinguishes among different types of common data disks
- Distinguishes among different types of common diskette drives
- Describes the function of a diskette
- Identifies the various drives in a computer

Academic Knowledge and Skills

- MAT 1-40

Standard: Explains the operation of the computer operating system.

Occupational Knowledge and Skills

- Explains what a computer operating system is
- Explains what a formatted diskette is
- Explains the procedure for formatting a diskette
- Explains the procedure to copy all files on one diskette to another diskette
- Explains the procedure to copy one file on one diskette to another diskette
- Deletes a file
- Identifies a system prompt and basic dialog box
- Describes the action required by a system prompt and basic dialogue box
- Describes a computer program
- Defines ROM and RAM

Academic Knowledge and Skills

- MAT 1-40

* Taken in part from the CORD document: National Voluntary Skills Standards, Hazardous Materials Management Technology Standard

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Using Computers to Process Information *continued*

Standard: Describes the operation and/or demonstrates the use of a word processor program.

Occupational Knowledge and Skills

- Loads a word processing program
- Uses a menu to select specified features of a program
- Describes what a word processing program does
- Accesses and uses HELP screens
- Uses arrow keys or mouse to move cursor to various parts of monitor display
- Moves individual characters or blocks of data from one location of a document to another
- Moves data from one document to another
- Copies data from one document to another
- Saves data entered into a word processing program to the hard drive and to a diskette
- Loads a word processing data file
- Deletes individual characters or blocks of data within a document
- Places page breaks within a document
- Uses a "search" command to locate a character or a string of characters within a document
- Uses the "undo" command to reverse the previous edit
- Uses a "spell checker" to locate and correct misspelled text within a document
- Prints a document
- Uses word processing program to create a correspondence document that follows standard formatting guidelines for margins, tabs, and line spacing

Academic Knowledge and Skills

- MAT 1-40

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Using Computers to Process Information *continued*

Standard: Describes the operation and/or demonstrates use of a spreadsheet program.

Occupational Knowledge and Skills

- Describes what a spreadsheet program does
- Loads a spreadsheet program
- Enters data into rows of a spreadsheet
- Enters data into columns of a spreadsheet
- Sums the data of a spreadsheet column
- Sums the data of a spreadsheet row
- Uses simple formulas in spreadsheet cells to calculate desired values from data in other cells
- Uses a spreadsheet program to make a line chart of data
- Uses a spreadsheet program to make a bar chart of data
- Uses a spreadsheet program to make a circular (pie) chart of data
- Saves data entered into a spreadsheet program to a diskette
- Loads a spreadsheet file

Academic Knowledge and Skills

- MAT 1-40

Standard: Describes the operation and/or demonstrates use of a database program.

Occupational Knowledge and Skills

- Describes what a database program does
- Loads a database program
- Enters data into a database table
- Saves data entered into a database program to a diskette
- Loads a database table
- Searches for information in a (query) database table

Academic Knowledge and Skills

- MAT 1-40

Understanding Systems

Knows how social, organizational, and technological systems work and operates effectively with them.

Standard: Understands organizational systems.

Occupational Knowledge and Skills

- Describes the relationship of organizations to systems
- Discusses general systems theory
- Discusses organizational theory
- Discusses open and closed systems, and living and non-living systems
- Discusses information as it relates to systems
- Defines analytical models
- Discusses how systems relate to management, supervision, enterprise, and administration
- Draws an organizational chart
- Discusses communication, manufacturing, construction, and transportation systems

Academic Knowledge and Skills

- MAT 1-40

Selecting Technology

Chooses procedures, tools, or equipment including computers and related technology.

Standard: Demonstrates the ability to select the proper hand and power tool for a particular task.

Occupational Knowledge and Skills

- Identifies proper hand and power tools for appropriate task
- Discusses the advantages/disadvantages of using hand tools vs. power tools

Academic Knowledge and Skills

- MAT 1-40

Applying Technology to Task

Understands overall intent and proper procedures for setup and operation of equipment.

Standard: Demonstrates the ability to operate hand and power tools.

Occupational Knowledge and Skills

- Refers to service manuals for tool operation and maintenance
- Uses power tools in accordance with operation and service manuals
- Uses manual tools in accordance with use manuals

Academic Knowledge and Skills

- MAT 1-40

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General Occupational Knowledge and Skills

The following section includes the general workplace knowledge and skills that will provide a job seeker with the tools to secure employment and perform safely in a professional manner. This worker will be able to understand the basic economic ramifications of employment and when it becomes necessary to transition successfully to new employment.

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Hazardous Materials

Identifies and handles hazardous substances in the workplace.

Standard: Demonstrates an awareness of safety, health, and environmental standards.

Occupational Knowledge and Skills

- Interprets safety symbols
- Discusses hazardous materials and hazardous waste emergency situations outlined by regulatory requirements
- Describes equipment related to hazardous materials and hazardous waste operation requirements
- Identifies location of material safety data sheets (MSDS)
- Implements applicable safety regulations and procedures
- Discusses the selection and use of appropriate personal protective equipment
- Discusses the transportation and storage of hazardous materials and hazardous waste in accordance with applicable regulations
- Demonstrates knowledge of hazardous materials, hazardous waste, treatment, and disposal systems
- Discusses emergency or shutdown procedures used during severe weather
- Describes the hazards of electricity

Academic Knowledge and Skills

- SCI 157
- MAT 1-40

Work environment

Maintains a safe and healthy work environment.

Standard: Maintains safety, health, and environmental standards at the worksite.

Occupational Knowledge and Skills

- Reads and follows safety information
- Complies with shop and equipment safety rules
- Follows state, federal, and/or manufacturer's safety rules for equipment operation and maintenance
- Observes and documents safety practices
- Observes and complies with safety zones around equipment
- Demonstrates the knowledge of safe tool and equipment use in the workplace
- Complies with safety precautions when storing and using chemicals
- Wears appropriate protective clothing for the job
- Discusses conservation and environmental practices and policies
- Maintains a clean and orderly work area
- Operates equipment defensively
- Interprets safety symbols
- Reports safety concerns/violations to supervisor
- Complies with responder first-aid and CPR certification requirements

Academic Knowledge and Skills

- SCI 157
- MAT 1-40

Employment Plan

Develops an employment plan.

Standard: Plans the use of allocated resources to develop workplace skills.

Occupational Knowledge and Skills

- Matches interests, attitudes, aptitudes, and physical capabilities to employment area
- Identifies short- and long-term work goals
- Identifies career information from counseling sources
- Demonstrates a drug-free status
- Recognizes the organizational structure of the workplace
- Organizes work schedules and responsibilities

Academic Knowledge and Skills

- MAT 1-40

Seeking and Applying for Employment

Secures employment.

Standard: Demonstrates the proper skills for seeking and securing employment.

Occupational Knowledge and Skills

- Locates employment opportunities
- Identifies job requirements
- Locates resources for finding employment
- Prepares a resume
- Demonstrates interviewing skills
- Identifies conditions for employment
- Evaluates job opportunities
- Identifies steps in applying for a job
- Writes job application letter
- Writes interview followup letter
- Completes job application form
- Identifies attire for job interview
- Analyzes potential barriers to employment
- Identifies continuing education opportunities
- Identifies state licensing or certification requirements

Academic Knowledge and Skills

- MAT 1-40
- COM 1-2, 5, 7, 11, 17, 21, 23, 33

Accepting Employment

Undertakes procedures for successful job acceptance.

Standard: Demonstrates the proper skills necessary for successful transition to a work environment.

Occupational Knowledge and Skills

- Accepts or rejects employment offer
- Completes Employee's Withholding Allowance Certification Form W-4

Academic Knowledge and Skills

- MAT 1-40
- COM 2, 23

Interpreting the Economics of Work

Understands economics involved in the work setting.

Standard: Understands the responsibilities of employers and employees to themselves, to each other, and to the job.

Occupational Knowledge and Skills

- Identifies the role of the technical/engineering field in the economic system
- Describes the responsibilities of the employee
- Describes the responsibilities of the employer or management
- Investigates and evaluates opportunities and options for entrepreneurship in the technical/engineering fields
- Assesses entrepreneurship skills

Academic Knowledge and Skills

- MAT 1-40

Maintaining Professionalism

Adopts the demeanor necessary for success at work.

Standard: Identifies key elements that comprise professional standards in the workplace.

Occupational Knowledge and Skills

- Participates in employment orientation
- Assesses business image, products, and/or services
- Identifies positive behavior
- Identifies company dress and appearance standards
- Maintains professional competency
- Actively participates in meetings
- Identifies work-related terminology
- Describes how to treat people with respect
- Maintains positive relations with others
- Exhibits characteristics needed for advancement
- Exercises the rights and responsibilities of citizenship in the workplace
- Follows legal regulations
- Recognizes economic importance of industry
- Recognizes environmental importance of industry
- Recognizes the relationship of self-esteem to work ethic
- Recognizes current accreditation and government regulations
- Recognizes the organizational structure of the workplace

Academic Knowledge and Skills

- MAT 1-40
- COM 1-15, 19, 41

Adapting and Coping with Change

Understands the factor of change in the work environment.

Standard: Understands the fact that change will occur in careers and be prepared for this work environment change.

Occupational Knowledge and Skills

- Adapts to changes in the job market
- Identifies elements of job transition
- Formulates transition plan
- Identifies implementation procedures for a job change
- Evaluates the transition plan
- Exhibits ability to handle stress
- Recognizes the effect of work on family
- Recognizes the effect of family on work
- Recognizes need to change or quit a job
- Writes a letter of resignation

Academic Knowledge and Skills

- MAT 1-40
- COM 23

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